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MSS. intended for publication and books, etc., intended for review should be sent to the Editor of SCIENCE, Garrison-on-Hudson, N. Y.

THE AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE.

SECTION I—SOCIAL AND ECONOMIC SCIENCE.

THIRTY-FIVE papers were on the printed program, of which seventeen were read in person, seven by title with abstracts of contents presented and eight papers were never forwarded by the authors, for various reasons. The statistical paper by Professor Arthur Lefevre on 'Public Education in Texas,' arrived too late for use.

Professor W. R. Lazenby's paper on 'Relations of Forestry to Soil and Climate' will appear in the *Proceedings* of the Ohio State Forestry Society at some future date.

The paper read by Professor Bruce R. Payne, University of Virginia, on 'The Social Service of the Public High School,' will also be published later.

Attendance at the meetings ranged from fifteen to fifty persons. Holding the sessions at the board of trade rooms was a mistake. The business people did not attend, and we were too far away from the other sections to admit of their members attending.

The following officers were elected:

Sectional Committee—Irving Fisher, Charles A. Conant, Carroll D. Wright (five years), E. L. Corthell (four years), W. R. Lazenby (three years), Frank A. Rutter (two years) and B. E. Fernow (one year).

Member of Council—Marcus Benjamin.

Member of General Committee—Le Grand Powers.

Possibilities of Cotton Warehousing from the Producer's Standpoint: EUGENE WILLIAMS, Waco, Texas.

An elementary principle in political economy is that the raw product should remain at the most available market nearest its field of production until required for actual consumption. Such a policy will save to the cotton belt losses estimated at over $100,000,000 annually from country damage, waste, violent fluctuations in prices, and other unbusiness-like results. The country damage alone to the crop of 1904–5 is estimated at from $5,000,000 to $10,000,000, an amount sufficient to erect a most efficient warehouse system throughout the entire cotton belt. To save these losses for the next and all succeeding crops a warehousing system should be established. This weather damage is a slight loss compared with the costly results which follow the inexperience of farmers as salesmen and the outrageous effects upon the market brought about by artificial influences.

The prices actually paid for single bales of cotton on the streets of a country market town, contrasted with the prices received by farmers who concentrated their several small holdings in a small galvanized iron warehouse in the same town, show that this single warehouse, by bringing under its friendly control a few hundred bales of cotton offered and sold in lots, realized from one eighth to one third of a cent per pound, or from 60 cents to $1.60 per bale, more than if sold by the single bale on the farmer's wagon. This rate of increase in price would realize from six to sixteen million dollars on the entire crop.

Therefore, I favor erecting a small warehouse in every town marketing approximately 1,000 bales of cotton, or over, annually, as contrasted with a few large city warehouses, because: (1) The farmer would be willing to hold his cotton in his market town, but would not be willing to ship it to a distant city warehouse; (2) the farmer would sell his cotton at a loss rather than ship to a distant city warehouse; (3) a local warehouse full of farmers' cotton would bring the increase in price to the farmer, whereas the large city warehouse, full of exporters' cotton, would not help the farmer who produces it; (4) the local warehouse full of farmers' cotton would bring to the local banks for deposit the increased volume of money flowing from the excess in price received by the farmer for his cotton; (5) cotton held by farmers in local warehouses would provide for local banks the best possible collateral for farmers' loans to carry the cotton; (6) the increase in deposits and choice collateral for loans would tend to decrease the rate of interest and multiply manifold the local bank's volume of business and its profits, while serving its customers better and upbuilding its home town; and (7) small warehouses would do more to encourage cotton mills in the cotton belt than all other influences combined. Large warehouses at distributing centers would take care of themselves.

Factors Determining the Price of Sugar: Dr. Frank R. Rutter, Washington, D. C.

The remarkable increase last year of 50 per cent. in the price of German raw sugar for exportation was due to a decrease of only 7½ per cent. in the total sugar production of the world. The price of clarified sugar in New Orleans advanced over one cent a pound, but this year has returned to its former level.

The main part of the paper deals with deviations in the sugar prices of the United States from the world prices as represented by German quotations for export sugar. It is shown that the tariff reductions in favor of sugar from particular islands—from Cuba, Hawaii, Porto Rico and the Philippines—has considerably depressed prices for raw sugar in the New York market during the months from December to June,

of each year, when these sugars usually more than suffice for the requirements of refining. Louisiana sugars are at a disadvantage from being marketed within this period. From 80 per cent. to 85 per cent. of the total receipts of New Orleans are sold in November, December and January. Besides this, the prices for refining grades are then invariably reduced, from thirteen to nineteen cents per hundred pounds below New York quotations, simply because it would cost approximately that amount to ship Louisiana sugar to New York. But this is merely a relic of the time when large quantities of the Louisiana product were shipped by water to the Atlantic ports. It does not seem to be justified under present conditions, when New Orleans possesses large refineries, has more advantageous freight rates than New York to interior territory, and annually imports between March and September, from 100 to 500 million pounds of foreign sugar. The depression in the price of raw sugars by no means causes a corresponding reduction in the price of refined, which is almost uniformly kept above the price at which German refined sugar could be imported after paying the full customs duty.

Relation of Higher Education to the Economic Development of the South: Chancellor J. H. KIRKLAND, Vanderbilt University, Nashville, Tenn.

The relation of economic development to education is most intimate. The work of the world is done by mind, not muscle. There is not enough muscular power available to reap the wheat crop of a single year. Universal elementary education is the first condition of material progress. Industrial training is also desirable for a large class of our population, but such training should develop the head as well as the hand.

1. Universities have largely modified their courses in response to the demands of practical life. Professional courses are offered for the training of engineers, chemists, electricians, manufacturers, and in every science applied courses open to all students the new lines of industrial development. Universities contribute to economic development by fundamental instruction in the general principles of science. Abstract mathematical research lies at the foundation of every science.

2. Universities contribute to economic development also through work done in philosophy, history, political science and economics. We need, as industrial leaders, men of broad sympathies and wide vision. The application of ethics to industry is as important as a new invention or an improvement in machinery.

3. Universities should also propagate sound economic doctrine. They should educate the public. Political education must be coextensive with the ballot. Economic fallacies are peculiarly dangerous when they receive a political embodiment.

4. So far as the south is concerned, its universities have been too poor to fulfil the tasks outlined. Scientific instruction is still meager, and our laboratories poorly equipped. But little is done in the departments of history, economics and political science. The south should take advantage of the experiences of other sections in achieving its great economic progress. For example, we do not need to build up our factory system on the pernicious fallacy of child labor. This question has been fought out in old England and New England. The south has learned the failure of slavery as a source of wealth and child labor is not far removed from slave labor.

5. Politically the south has inherited the spirit of leadership and the traditions of good government. But we, too, have built up an art of politics and developed our machines. We have deified party fealty.

But we have yet to work out the reign of intelligence in political life. We have yet to learn that our chiefest political issues are clean, honorable, frugal and efficient administration of the simple duties of public office. We have yet to learn the intimate relation between righteousness, intelligence and economic prosperity.

Teaching Agriculture in Rural Schools: Professor W. F. Massey, North Carolina Agricultural Experiment Station, Raleigh, N. C.

1. The agricultural colleges have been greatly handicapped in their development of efficiency for want of preparatory courses in agriculture in the secondary schools.

2. Though the time is not yet ripe for the general establishment of district schools for agriculture, the great need of the times is some elementary instruction in the form of branches of study applicable to the work of the farm.

3. The next great need is the training of teachers. This is beginning to be met by summer-school courses at our colleges of agriculture. School children's interest should center not only on the natural productions of the locality, but also on the study of the soil, methods of tillage, influence of sunshine, rain and the weather generally on plant life and growth. At the St. Louis Exposition 8,000 specimens of corn were exhibited which that number of boys in Illinois had raised, 1,250 of whom took prizes ranging from 50 cents to $500.

4. The south needs this work especially, and must begin with a kind of kindergarten work with the youngest, to be followed by the school garden work for the older or more advanced pupils. The children of the farmer will see in this occupation the future which they seek—a future which will keep them not only from forsaking the old homestead, but result in multiplying homesteads, where abandoned fields now await the magic touch of scientific intelligence.

Some Problems of Agriculture in Texas: Professor G. S. Fraps, Texas Experiment Station.

The problems of Texas are on the whole those of a rapidly developing country, a search for men, money, crops adapted to the soil and markets to sell them. The maintenance of the soil fertility is beginning to be of importance. The cotton men have the boll weevil, the boll worm, dead cotton; the rice men, to institute a rotation and soil treatment which will maintain the productiveness of their soils. The cattle men are improving their stock. Fertilizers are being used, and their use is increasing.

Utilization of the By-products of the Cane-sugar and Rice Mills: Professor W. R. Dodson, State Experiment Station, Baton Rouge, La.

Louisiana leads all other states in the union in the production of these by-products, and has done more than has been done elsewhere in determining their real value and encouraging their utilization.

There are three main by-products in the rice mills of Louisiana: rice hulls, rice bran and rice polish. Rice hulls are practically of no value as foodstuffs, while rice bran and rice polish are of great value as such. Rice polish is now worth from $22 to $24 per ton, and it ranks high as a concentrated foodstuff. Compared with wheat bran, it contains 20 per cent. more digestible carbohydrates and 4 to 4½ per cent. less digestible protein. Rice polish is very valuable foodstuff for swine. Rice bran has been greatly adulterated as it rose in public estimation and in value as foodstuff. The adulteration is principally with ground rice hulls, which are practically of no value as food. Sometimes mixed rice and wheat bran are found for sale on the markets in

Louisiana, being sold as pure wheat bran. In these instances analysis reported on rice meal indicated that there had been an addition of rice hulls. The law in Louisiana, which has been in existence for about one year, requiring the manufacturer to tag each sack of bran, giving the composition of protein, carbohydrates, fat and fiber, has served to some extent to check the wholesale adulteration of rice bran.

With regard to the by-products of the sugar mills, molasses, which a few years ago was held to be refuse, and was either given away to be taken out of sight and out of the way, and which often was dumped into the plantation ditches, is now considered a most valuable ingredient in the feed of stock, and is worth at least $8 per ton.

Relation of Schools to Civic Improvement: LOUISE KLEIN MILLER, Curator of School Gardens, Cleveland, Ohio. (Illustrated by stereopticon.)

An instructive description of work done in Cleveland, under public school auspices, with private cooperation, by which many vacant lots were transformed into flower beds and vegetable gardens, especially in portions of the city where such properties are often neglected or used as dumping grounds. Back yards, from being cheerless and uninviting, by proper encouragement of the young as well as the aged, became sources of enjoyment where the first lessons of horticulture and vegetable gardening were learned, thus contributing to the pride and pleasure of the people in their homes as well as to the health and beauty of the neighborhood.

At the end of five years the Home Gardening Association, through which this work is developed, finds its work more widely known and its aim better understood. This is manifest in a number of ways. The occupant of a small house is furnished an incentive to make the yard attractive. The real-estate dealer recognizes the improvement in the appearance of property and appreciates the consequent increase in values. The teachers and school officials, almost without exception, concede the vital interest aroused in the pupil and are ready to make use of this aid to school work. People concerned for the improvement of city conditions are satisfied that this is one of the effective means to secure that most desirable result. Inquiries from other communities are increasing, and, in a number of instances, work along similar lines has been started.

Southern Cotton-mill Workers: Their Condition and Needs: Rev. J. A. BALDWIN, Piedmont Industrial School, Charlotte, N. C.

Before the war the poor white people had very meager educational advantages, and consequently most of them were illiterate. Much has been done for their descendants at the mills, but so much still remains to be done that the situation is really appalling. The public schools are to be found at every mill, and are doing much good, but there is much to be done which they are not doing and can not do. Some kindergartens have been established. There ought to be many more. With shorter hours of labor, which are sure to come, special impetus will be given to night classes. But there are thousands of young people who can not read and write, and very few of the others can do much more. They have in them wonderful possibilities, as evidenced by the fact that most of the superintendents and practically all the room overseers have come right up from the lowest places in the mill. These young people are beginning to be interested in education. They are awaking from the sleep of generations. But there are no schools that suit them.

They are too old to go into the schools

for young children. They must have their needs met in other ways. In addition to common school courses suited to their needs the boys should have a textile course, and the girls a course in domestic science. The more favored classes have their colleges and universities; the negroes have their Hampton, their Tuskegee and other schools. The cotton-mill people of the south have nothing. A thoroughly equipped boarding school, giving the course as indicated, with expenses low, and giving opportunity for students to work part of the time in the mill and on the farm, will prove of incalculable service to humanity. Such a school has been established as a private enterprise at Charlotte, N. C., the center of the cotton-mill industry in the Piedmont section. After two years the school has an enrollment of 120 pupils. It is working with an endowment of 277 acres of land located in a rapidly growing suburb, where many of the students work half of their time in the mills and attend school the other half. Mr. Baldwin's intention is to establish later, if possible, a small cotton mill, where the students can put in a portion of their time working out their tuition. The curriculum has been arranged with a view of adaptation to the needs of the operatives and includes courses in English branches, textile training, agriculture and domestic science.

Industrial Training and the Negro Problem in the United States: Principal E. L. Blackshear, Prairie View, Texas.

Herbert Spencer's conception of education as the correlating of the human unit to his physical and social environment has grown into the modern complex notion and system of industrial training which is physical on one side and intellectual and moral on the other. Objectively, it is the training of muscular energy and sense-perception in intelligent physical process, directed to a final cause or end; the realization of the ideal; the training of hand and eye. Subjectively, it is the discovery of the means, methods and process by which the ideal is to become real and useful, involving the exercise and development of observation, analysis, discrimination, criticism, choice and will; the formation of the work-habit, with its properties of persistence and fidelity; and the creation of character, with its endowments of self-control, self-culture and self-support in their relation to serviceableness to the general good.

It is obvious that this form of training is just that needed to adjust a primitive people like the ex-African negroes to highly specialized industrialism of the American politico-economic system; it is the training, too, that must be applied to the Filipino and to the African natives if these backward peoples are to become progressive and self-sustaining.

This theory was first put into practise by General Armstrong in a system of training for the emancipated blacks at Hampton, Va. This work gave birth to the Tuskegee Institute, under Booker T. Washington, and established a system of manual and industrial training for the blacks on the only principles which give reasonable promise of a solution of the negro problem involving the enhanced value of the race to American society.

As evidence that it is worth while we cite proofs for the productive value of negro labor. The negroes are doing the bulk of the hard, undesirable labor of the south in all lines—its menial, agricultural and heavy contract work, track-work, grading and excavating, heavy mill and foundry work, and the work of the stevedore. They do some of the work of the mechanic and probably the bulk of the hard work connected with the culture of cane, cotton, sugar, tobacco and rice.

Further, negro labor is the most effective

cheap labor and the cheapest effective labor the south can get; and the whole country is calling for labor. If it were not for European emigration, the United States would be at a great economic disadvantage. But immigration may not continue always and in the keener competition of the future between the commercial nations, the labor of the negroes may be very useful.

As to the relation of training for negroes to the race problem, that is to the problem of how best to maintain normal and helpful relations between the whites and the blacks, it can be said that industrial training will help to better relations by making negro labor useful to the white employer of labor and hence more necessary to the successful conduct of the business and industrial operations of the south. The chief complaint made against negro labor has been that it is not prompt and not regular, faults which training will remedy.

By way of summary, the applicability of industrial training to a race in the condition of the negro; the industrial capacity of the race as shown by the African tribes and ex-African slaves; the testimony of the existing poorly equipped negro industrial schools; the present distribution of negro laborers among American industries and their relative success in them; the extent to which the south uses negro labor in domestic, industrial and agricultural lines; the large acreage of southern farm lands worked by negro farm labor; the large per cent. of negroes engaged in the useful industrial pursuits in all parts of the Union; the eagerness of the negro youths to secure industrial training; the sentimental and historic obligation of the American people to the blacks in view of their responsibility for their presence in America; the economic debt the nation still owes them for generations of unrequited labor and for tremendous present values accruing from that labor—these and other considerations point to industrial training as the need of the hour for the negro people, and as the solution of the race problem, as well as to the duty of the nation through federal agency to make provision for the establishment of a chain of schools to accomplish this great and beneficent purpose.

Social Work of the General Federation of Women's Clubs: Mrs. A. O. GRANGER, Chairman Child Labor Committee, Cartersville, Ga.

The General Federation was organized by Sorosis in New York City in March, 1889, and now includes working clubs in Alaska, England, India, China, Hawaii, Mexico, Porto Rico, Chili and Western Australia. The central point toward which all its work tends is the *child*. The men and women of to-morrow are the children of to-day, and everything that tends to make the conditions of child-life better is of importance. As a federation it seeks to coordinate the great variety of women's clubs upon this central aim, and its policy is best expressed by its motto—unity in diversity. It seeks to enable the less fortunate to share the enjoyment of the better things in our civilization. It avoids fields already covered by social effort and trains its members to fill the gaps and to do the work neglected by others.

Among its most active committees are one to develop true art in school work; another to further the use of good literature, working with the committee on library extension among our schools; a third on household economics for the better conduct of home affairs from the business standpoint. The pure food committee quickens the public conscience against adulteration. The civic committee occupies itself with several lines of work—sanitation, training for citizenship, municipal morality and the beautification of the city. Its committee on civil service reform helps to mold the

sense of official honor. The committees on forestry, on education, industrial conditions, on child labor, have helped to develop an enlightened public opinion on all these vital questions in an effort which covers the entire country.

Progress of the Negroes of Virginia as Property Owners: Charles E. Edgerton, Washington, D. C.

This is an examination of the rate at which property has been acquired by the negroes of Virginia, with especial reference to the question whether the economic character of the present generation of negroes, as indicated by this test, is inferior or superior to that of the generation which was trained in slavery and freed by the war. The data are derived from the census and from the local assessments for taxation. The property of negroes was first shown separately on the assessment books in 1891, and the last assessment here used is that of 1903, giving an interval of twelve years.

The number of negro farmers in Virginia who owned their farms free of encumbrance in 1890, according to the census, was 13,097. If we assume that the negroes started without property in 1865, the number of negro farmers in the state who acquired full ownership of their farms between 1865 and 1890 amounted on an average to 524 a year. But during the next ten years the number was 913 a year, or 75 per cent. greater. If all farm owners, mortgaged as well as clear, are included, the number was 547 a year from 1865 to 1890, and 1,394 a year, or two and a half times as many, from 1890 to 1900.

On the same assumption that the negroes had no property at the close of the war, the assessments for taxation indicate that they acquired 26,000 acres of land a year from 1865 to 1891, and 38,000 acres a year, or almost half as much again, from 1891 to 1903; and rural buildings to the value of $53,000 a year from 1865 to 1891, and to the value of $110,600, or more than twice as much, from 1891 to 1903.

In proportion to their numbers, the negroes increased their acreage of land, and the total value of their rural real estate, two fifths faster from 1891 to 1903 than from 1865 to 1891, and the value of their rural buildings twice as fast.

The number of negro farmers who owned their farms clear of encumbrance in 1890 was only 26 per thousand of rural negro population, according to the census; in 1900 it was 42. The negroes had only a third as many unencumbered farm owners as the whites in proportion to their rural population in 1890; in 1900 they had half as many.

The assessed value of town real estate owned by negroes was $4,650,000 in 1891, and $6,350,000 in 1903. It increased in considerably greater ratio than the town negro population, while the assessed value of the town property owned by whites did not increase in so great a ratio as the white town population.

In Virginia, at least, the negroes have increased their property holdings more rapidly since the ante-bellum negroes ceased to be an important economic factor than they did while the older generation occupied the stage. In view of this unquestionable statistical fact, it can hardly be doubted that the economic efficiency of the present generation, at least in Virginia, is greater than that of the generation that was trained in slavery.

Railway Conditions in Texas: O. B. Colquitt, State Railway Commission, Austin, Texas.

How much of the stock and bond issues of Texas railroads is 'fictitious' no man can tell without access to the old books of the companies, almost all of which have

passed through the 'wrecking' period, and in many instances new companies formed to take over the property of the wrecked company. The total of stock and bonds outstanding June 30, 1893, the year the stock and bond law went into effect, was $392,726,113, on 9,198 miles of road, an average of $40,250 per mile. The commission's estimate of what it would cost to reproduce all the railroads in Texas on June 30, 1904, was $16,244 per mile. The estimate was made on what it would cost to reproduce the roads—the old roads—in their condition at the time they were valued, the materials, cost of labor, right of way, etc., being figured at average prices prevailing at time of valuation. On the average estimated cost of reproduction, the 9,198 miles of operated railroad in 1893 were worth $149,422,312, showing $243,303,801 of the outstanding bonds and stocks to have been 'fictitious.'

Management, under apparently like conditions, has much to do with state railway regulation. They had equal privileges conferred. Of three examples cited, the first is laid in a populous, rich section, running from north to south, and the earnings and accumulations have been great. Years of operation make a good showing of surplus which is in the hands of its owner in New York.

The second, running from south to north, in a rich and populous section of the state, had a large income from operation, but either spent it in 'riotous living' or so merged it with that of its dominant owner as to show a condition of bankruptcy on its own books.

The third is in a sparsely settled part of the state, unassisted by domination, and aided alone by its own energy and prudence, and with the same rates prescribed by the state for the others, has prospered, and distributed its surplus earnings to the numerous holders of its shares of stock. Which of these three do you say has employed its privileges to the best advantage and to the greatest credit of the state?

This brings us to a discussion of freight rates. What is the proper basis for rate-making? Shall they be fixed with reference to the capital invested? Should they be made with reference to the value of the commerce transported? Should they be fixed upon the theory that they should be 'all that the traffic will bear'? Or must they be fixed and adjusted so as to pay all fixed charges, operating expenses, betterments, etc., and leave something for the stockholders?

If the latter basis should be adopted how would you adjust the rates to meet the showings made by the three roads I have taken for illustration? The management of one road might, on the same rate, with the same tonnage, same capital and investment make money, and another lose. You can never fix rates that will be reasonable to the shipper on that basis unless you have control of the finances and operate the line independently. One Texas line paid out $30 per 100 train miles for maintenance of equipment, while another paid only $15 last year.

If you base rates on the theory that they shall be 'all the traffic will bear,' the movement of freight on such rates will be restricted to the actual, economical requirements of all freight-paying commodities. Such a rule will not stimulate the movement of commodities of small value.

From what I have already said it is also conclusively shown that you can not use the bond and stock issues of the roads as the proper basis for rate-making.

Proposed Solutions of the Railway Rate Problem: H. T. NEWCOMB, Washington, D. C.

This paper applies especially to commercial rates as related to the work of the

interstate commerce commission. This commission is a federal agency of high authority and the law under which it exists is a broad and comprehensive statute which has strongly influenced the economic life of America since its enactment in 1887. It forbids every unreasonable interstate railway rate and every undue discrimination among rates, and the commission has the right to condemn any unlawful rate or practise. Much of the work of the commission is accomplished through its agencies for publicity and by conciliation; at least eighty per cent. of the complaints it receives are settled by its informal and mediatory action; seventy per cent. of its formal orders are voluntarily obeyed. In nearly nineteen years only forty-seven cases of disobedience to its orders have been presented to the courts, and of the thirty-five final decisions rendered all but four have been that the order disobeyed was unlawful. In four cases the orders have been enforced by the courts, thus proving that the power exists when the commission acts lawfully. In addition the Elkins law has proved a prompt and effective remedy for unjust discrimination.

So much for existing law. Many proposals for new legislation are now before the congress and the people. This paper has been prepared especially to point out certain broad principles in connection with them. The measures proposed fall plainly into two classes. There are proposals which contemplate: (*A*) A single act of legislation leaving the enforcement of the law to the ordinary executive and judicial machinery supplemented, as at present, by the interstate commerce commission, and, (*B*) successive acts of legislation, each specially adapted to the conditions peculiar to a particular case.

The conclusion reached from a study of existing methods and conditions is that, with our laws as they are, there is no genuine instance of injustice in interstate railway rates which can not be remedied under the present law, and that the existing remedies can be applied as promptly as those which government provides or can provide for wrong of any sort when the interests concerned are of great magnitude. To adopt the other theory would be to rely on law-made rates instead of rates determined by the market.

Methods of Developing Traffic, Industry and Immigration by a Modern Railway: J. F. Merry, General Immigration Agent, Illinois Central Railroad.

The fact that more than 98 per cent. of the $1,975,174,091 collected and disbursed by the railroads of the United States in 1904 was from traffic, and less than 2 per cent. from all other sources, presents a good and sufficient reason why the railroad companies of this country should employ only the best methods of extending this almost exclusive source of revenue. There are many ways by which traffic may be increased, but the following methods have been, and are still, in use by all modern railroads:

1. A study of the agricultural resources and possibilities of the country on and adjacent to its lines and the encouragement of every legitimate effort to develop them.

2. A careful study of the industrial conditions that obtain in all the territory through which its lines run and the taking of such steps as will permanently locate factories at as many points as practicable for the manufacture of raw material, and the employment of labor and capital.

3. Providing modern equipments and quick service for the handling of merchandise and the products of the farm and factory.

Methods of development by the Illinois Central began with turning its 3,700 acres per mile of road into freight-producing

territory. The grant of 2,594,115 acres was marked at from $1.25 to $2.50 per acre. Soon every public highway was lined with covered wagons from New England and the middle states, from Ohio and Michigan, filled with men, women and children as pioneers in the peopling of the prairies along our line, so that by 1870 the state of Illinois was nearly as densely populated as the east. Before 1880, the fruit commission men at Chicago had never seen a consignment of fruits and vegetables from south of the Ohio River. About that time, as the eastern states could no longer supply the west with table luxuries, this road began experiments with strawberries, peaches and other varieties of fruits and vegetables in Tennessee, Mississippi and Louisiana. Much of this was done on cut-over forest lands supposed then to be of no agricultural value whatever. The first carload from south of the Ohio over this line reached Chicago in 1881. In 1903 there were shipped to Chicago alone 128 carloads of strawberries from points between Grenada, Miss., and Keener, La., not counting the earlier and later shipments by express. In the same year 1,805 cars of vegetables were shipped north from the same territory, including New Orleans. The road had 35 refrigerator cars of 14 tons each in its entire service when the experiments began; since then the company has placed in the service 2,491 cars of 60 tons capacity, in addition to 1,510 fruit cars, making a total of 4,001 cars. From one point in Louisiana 200 carloads of strawberries, and from another in Mississippi 800 carloads of vegetables, were shipped in one season, as grown on land too poor to be cultivated in cotton and thought to be of no value for anything. These fruits are hauled to market in refrigerator cars provided with springs that make them ride as easily as a passenger-coach.

The Restriction of European Immigration: O. W. UNDERWOOD, Member of Congress from Alabama.

During the year ending June 30, 1905, there came into the United States 1,026,000 alien immigrants; a greater number of people than all of the people who came here from Europe between the first landing at Jamestown and the Declaration of Independence, one eightieth of the people of the United States; and in ten years at the present rate it would equal an addition of ten million aliens, or about one tenth of the present population.

From the discovery of America down to the year 1880 the greater portion of the immigrants who settled in North America were from northern Europe. In the meantime the steamship companies had found that immigrants coming to America were a source of large revenue. When they found that this immigration was falling off they adopted artificial means to stimulate it. They found that it was more difficult to induce the people of northern Europe to come to America than it was to encourage immigration from southern and eastern Europe, where the conditions of the people were less favorable, and where they were more willing to leave their old homes. The result has been that the character of the immigration since 1880 has almost entirely changed: out of a total immigration for the year ending June 30, 1905, of 1,026,000 people only 221,019 were of Teutonic origin and 124,218 of Celtic origin. The balance were of Iberic, Slavic and Mongolian origin mostly. Ultimately we must assimilate and absorb these peoples.

We are now getting the weakest of European peoples, instead of the strongest. The steamship companies are indifferent to the quality of immigration if they can only get the quantity. There is scarcity of labor, to be sure; but many of our best

citizens are moving to Canada to escape competition with these very immigrants at home. The remedy is a head tax, increased from two to twenty-five dollars to prevent assisted immigration, and a requirement to read and write the constitution of the United States in some language.

The Jews in Russia: Their Economic and Social Position: I. M. Rubinow, Washington, D. C.

Of the five millions of Jews living in Russia, 95 per cent. live in the pale—that part of Russia in which Jews are permitted to live, and which constitutes only one fifth of European Russia. Only rich business men and professional people are permitted to live outside the pale. Even within the pale a Jew may not live outside the city limits. Many professions and trades and even agriculture are practically forbidden fields. In high schools and universities the Jews must not exceed a small percentage of the total number of the students. Petty commerce and hand trades and factory labor are, therefore, the only occupations left open to the majority of the Russian Jews. The result is congestion in these trades, cut-throat competition and poverty. To these conditions the Russian government intentionally remained blind and encouraged the preposterous claim that the Jews were prosperous exploiters of the Russian people, using the prejudice against the Jew as a safety-valve of the popular discontent, and not stopping short of direct organization of anti-Jewish riots, whenever the discontent became very acute.

But out of these abnormal conditions the remedy is gradually evolving. The poverty and congestion of the towns in western Russia produced a free labor market, which stimulated growth of manufacturing industry. And factories brought with them a powerful labor movement, more powerful for the many battles it had to wage, the battle of the Jew, of the Russian citizen and the horribly exploited workingman.

An organization was formed seven years ago, the so-called 'Bund,' which combined all these elements, and the results of its short activity are wonderful. It shortened the labor day from sixteen hours to ten or eleven, raised the pay of the workingmen and commercial employees about fifty per cent., and besides this narrow activity, has taught the Jews to stand up for their rights, to demand and not to beg reforms, to organize in self-defence against the anti-Jewish excesses, and what is more important, to create a strong movement for a free democratic government in Russia. The movement inevitably had far-reaching psychological effects. The patient, suffering and defenseless Jew of olden days was transformed into the energetic fighter for civic liberty, the enthusiastic labor-union man. The Russian Jew has finally regained his self-reliance and self-respect.

These important changes have a significant bearing upon the question of Jewish immigration into the United States. The Russian Jew, having determined to fight for his rights in his own land, is sure of accomplishing his purpose in the not distant future, and the victory will greatly diminish, if not altogether stop, the Jewish immigration to the United States. In the immediate future, however, due to the awful events in the southern cities, the current of immigration will continue unabated for some time. But the Jewish immigrant, being an ardent union man and enthusiastic warrior for the rights of labor, the usual objections against the immigrant from eastern Europe can not be applied to him; the new Russian Jewish immigrant is not a danger, but a powerful ally, of the American workingman in his struggle for economic and social betterment.

The Child-labor Problem: A Study in Degeneracy: A. J. MCKELWAY, Assistant Secretary, National Child Labor Committee, Atlanta, Ga.

The conditions of the child-labor problem in England at the beginning of the nineteenth century and in some of our American states at the beginning of the twentieth are so much alike, that the foreseeing of the same result is inevitable. Certainly there is no more pressing subject for consideration for patriot or philanthropist than the welfare of the coming race. As President Roosevelt said to our committee only last month, political questions like the tariff or the currency are insignificant, in comparison with a social problem like this. The life is more than meat and the body than raiment. Certainly there could befall a people no greater catastrophe than race degeneracy. It is sufficient to say here that this catastrophe is not only threatening, but already impending.

In the manufacturing states of the north and east the legislative problem has been largely solved and there remains only the problem of the adequate enforcement of the law. The industry which was chiefly cursed by child labor in England is the characteristic and commanding industry of the south, the manufacture of cotton; and the northern problem differs from the southern in being chiefly a foreign problem. It is the children of the French Canadian and the Portuguese and the Greek that demand protection in New England, the children of the Italian and the Slav in Pennsylvania. No child of American parentage has yet been found at work in the sweatshops of New York City. In the south it is especially an American problem, for it is concerned with the depreciation of the purest American stock on the continent. And this gives us another point of comparison between England and the south, namely, the similarity of the racial stock.

The same race degeneracy which progressed for a hundred years in England to its dire culmination is beginning already in the south. There has already been developed in our manufacturing communities a 'factory type' easily recognizable, the children distinguished by their pallor and a certain sallowness of complexion. Early employment tends to independence of parental restraint. The breadwinner becomes a man too, and early marriages are the rule. The wife and mother continues her work in the mill, since the wages of the husband are not enough for the support of the family. What must be the children born of such unions and their children? Diseases of the throat and lungs are common and also diseases peculiar to women, brought on by employment long continued at the critical period of a young girl's life.

We must save these children for their country. We must protect them from the consequences of untimely toil, the sapping of physical vitality, the marring of the mind and the spoiling of the spirit that come with the denial of the rights of childhood.

Why Advancing Civilization in America Increases Crime: Some Methods of Relief: Judge N. B. FEAGIN, Birmingham, Ala.

To train the citizen to live aright, to observe the moral and physical law, so that mankind may attain the highest possible perfection in physical, mental and moral manhood, is the duty of organized society. The Duke of Argyle in the middle of the nineteenth century said that the home, the church and the state were England's greatest civilizing factors. The state, through wise laws, justly interpreted and properly administered, can assure the citizen the protection of life, liberty and property,

and the pursuit of happiness. The wisest economy for the state is the greatest care and culture of the citizen from birth to death. This gives strength to good character and force for good citizenship that will exalt the nation.

Recapitulation of Causes.—(1) Advancing civilization increases crime, because of irrational methods. (2) By dealing with results instead of causes, relying more upon repression and reformation than upon formation and prevention. (3) By allowing officials interested pecuniarily in the arrest, confinement and conviction of offenders to have supervision over them. (4) By releasing offenders upon society worse morally and physically than when arrested.

Some Methods of Relief.—(1) Quicken the public conscience for the amelioration of social and economic conditions. (2) Remedial legislation in providing juvenile courts, detention homes and schools, probation system or suspension of sentence and the indeterminate sentence. (3) Efficient, intelligent and humane officials for the proper enforcement of these laws. (4) The substitution of salaries for fees for officials who deal with offenders. (5) Reliance upon formative and constructive methods rather than adherence to repressive and retributive ideals of justice. (6) A thorough revision of our legal provisions and methods of administration so as to relieve the state of the odium of participation in the creation of criminals.

These methods have passed the experimental stage; they are in accord with the dictates of law and philosophy, of science, morality and religion; and if adopted and wisely enforced in all our states, civilization will continue to advance and crime will decrease.

Race Degeneracy: Professor Jerome Dowd, Wisconsin University, Madison, Wis.

Among savages the degenerate and defective individuals were considered bewitched and hence speedily put out of the world. Even down to the eighteenth century mental and corporal afflictions were largely explained as demoniac possessions. The development of hospitals for the insane gave rise to the science of psychiatry and the effort to trace insanity to natural causes. Then the success of the psychiatrists stimulated the criminologists to inquire whether the moral perversities of the thief, the forger, the murderer, etc., were not also the result of inherited physical and mental defects. A still further step in the study of degeneracy was to inquire if the man of genius was not also, as the insane man and criminal, the result of a deteriorated physical or mental organism. Lombroso in Italy and Nisbet in England have attempted to show a necessary connection between degeneracy and genius. Nisbet cites in his book a long list of great men with the peculiar evidences of degeneracy which characterized each of them. Shakespeare, he says, belonged to a very degenerate stock, the average length of life of the children of his parents being only thirty-two years, and he himself died of a sort of 'epileptic seizure.' Milton was blind at the age of forty-four years, and his daughter Anne was lame and otherwise defective. Only one of his daughters had offspring, and she gave birth to ten children, of whom only three lived to attain adult age.

Advancing a step further in the study of degeneracy, Max Nordau, in Germany, has attempted to show that degeneracy is not a peculiarity of criminals, lunatics or men of genius, but that it is characteristic of all modern civilized races. Many of our celebrated men have all the special stigmata of the criminal or lunatic, but they manifest their defects in a way which escapes general notice. They are, however,

no less injurious to society. Instead of using the knife of the assassin or the bomb of the dynamiter, they use the pen and pencil.

Some sociologists, as Gumplowicz and Le Bon, have taken up the idea of degeneracy and declare that modern civilizations are destined to an inevitable decay and death.

Are there any reliable facts which would support the argument in favor of race degeneracy? Examining into the statistics of the insane, blind, deaf and criminal, the data are so imperfect that it is impossible to say whether conditions are becoming better or worse. The signs of family degeneracy are more serious than those of physical degeneracy or crime. There is no doubt about the increase of divorces and in many countries there is an increase of illegitimate children. Adultery seems to be less offensive now to public sentiment. The New York committee of fifteen recommended its erasure from the category of crimes. Abandonment of children to institutions suggests Plato's state control of child-rearing. In France 80 per cent. of the juvenile male criminals are illegitimate.

In spite of all the facts bearing upon degeneracy there are as yet no positive evidences of degeneracy and no occasion for alarm, but the present conditions and tendencies are far from satisfactory.

Economic Aspects of Accounting and Auditing: F. W. LAFRENTZ, President American Audit Company, New York.

Many states of the union have passed appropriate laws under which accountants may qualify and obtain certificates from proper governing boards.

Accountancy is not only applied mathematics, but also applied economics. The accountant must know the theory of values in order to properly understand his profession; and here is where he must consult the economist. He should guard against becoming a theorist pure and simple, however. It is necessary for him to be practical in the application of theory. He must know, for instance, when to stop in his analytical work, so as not to burden a business with detail that it is unable to carry. In other words, he must learn to adapt system to business and not business to system.

The documents in which the accountant sums up (epitomizes) the transactions recorded for any given undertaking are the balance sheet and the profit-and-loss account. The balance sheet shows, on the one hand, the goods that are owned by the business, and commonly described as assets. Now, the setting up of the assets in the balance sheet means merely the making of an inventory of the things owned; but in order to do that the accountant must set a value upon them. Here is where the knowledge of the accountant is put to the severest test. Not only must he know the valuation of all marketable staples, but he must know how to deal with the difficult problems of used machinery, dilapidated buildings, and that most elusive of all assets—good-will.

On the credit side of the balance sheet he will set up the debts for which the goods owned are a lien, so to speak, and which in case of liquidation must be deducted from the results gained in the disposition of the goods. If the goods are more than sufficient to meet these liens, the residue will be the net worth of the proprietor, the capital of the proprietor. The balance sheet, therefore, states the *condition* of wealth.

The net worth of the proprietor at a given time, when compared with his net worth at a different date, will show the increase or decrease in his wealth—or his profit or loss during the interim—and the reasons for such change will be found in

the profit-and-loss account, for it states the *flow* of wealth during a given period.

This account sets forth six features: (1) The business done as a whole and by departments; (2) the cost of sales, on the same basis; (3) the gross profits, on the same basis; (4) management expenses, which should not vary greatly with the volume of business; (5) profit or loss on the theory that sufficient capital is invested in the business; (6) the net result, profit or loss, after all allowances.

Here, then, we find mathematics and economics going hand in hand in aid of the accountant; for in the theories on which he bases his mathematical conclusions we recognize the theories of the science of economics. The themes of the economist, such as capital, profit, income, expenditure, value, property, labor, are the terms employed here. The forecasts of the economist, based upon economic principles, are brought into contrast with the actual results attained by the accountant. These results ought to be studied by the economist, so that he may keep abreast of the times, because the factors in the production and distribution of wealth change, and calculations based upon ancient conditions must necessarily be modified.

Honest, Safe and Economical Life Insurance: L. G. Powers, Bureau of Census, Washington, D. C.

Fundamental principles on which life insurance is based:

Some important facts relating to life insurance.

Life insurance, to be honest and safe, must fully recognize the scientific facts on which all such insurance is based.

These facts most fully recognized by the so-called old-line insurance companies.

Statement of the practical workings of insurance in such companies, by which they can furnish honest, safe and economical life indemnity.

Conditions under which assessment and fraternal insurance companies are unsafe agencies for securing life insurance, and also under which they may be trusted for furnishing the same.

Limited-term insurance the best form for those needing large life protection but who are temporarily receiving very limited incomes.

Old-line insurance with low expense of management preferable for all who have an income permitting of the accumulation of savings, and who wish insurance for a long term of years.

Old-line insurance with present large expenses of administration less desirable for the average individual for caring for savings and securing insurance than the best managed fraternal insurance companies.

Fraternities will become more scientific in their management and accumulation of reserves, and old-line companies will in time become less expensive in their management, and by both classes of companies the public will come to have more economical life insurance as well as honest and safe insurance.

The Census Returns on Manufactures: Edward Atkinson,[1] Boston, Mass.

The classification of manufactures by the Federal Census leaves much to be desired in the following respects: (1) The collective branches of industry which are conducted in large factories and workshops by great division of labor, distinctly manufacturing, according to the conventional use of that term; (2) the arts which are conducted by the use of modern tools and appliances, but yet remain distinctly

[1] Born, Brookline, Mass., February, 1827; died, December 11, 1905. Mr. Atkinson joined the American Association in 1880. He has been a constant contributor to Economic Science. An incomplete list of titles of articles published between 1877 and 1905, inclusive, credits him with 183 subjects.

mechanic arts, calling for the guiding hand of the artisan, notably the building trades; (3) the lesser branches of industry, both manufacturing and mechanic arts, conducted in small shops by combination of mechanism, improved tools and hand work.

A careful study may enable economists to establish very valuable deductions when these facts and figures are plainly stated. The deduction which I have made from such study as I can give is that the tendency is toward individualism rather than collectivism. That is to say, the arts which are conducted by large numbers of persons under one roof, subject to great division of labor, are becoming more and more automatic, and although giving employment to a large aggregate in each decade, they are giving employment to a less proportion of persons occupied as the decades go by. In some arts one can foresee the time when the only persons occupied will be those who keep the machinery in order and there may be none of the class now called operatives to attend to the product. On the other hand, the arts which require individualism, capacity, mental energy and manual skill, like the building trades, and many other of the arts listed under the title of manufactures, are calling for an increasing proportion of a constantly increasing number. I also find in every art that I have investigated a confirmation of the rule laid down by Henry C. Carey and Frederic Bastiat seventy years ago, namely, "in proportion to the increase and effectiveness of capital, the share of the annual product falling to capital is increased in the aggregate, but diminished in its relative proportion; while the share falling to labor or to the workmen and women is increased both absolutely and relatively."

I find in the history of every art, the course of which has not been interrupted or broken by tariff taxes (these arts being very few in number), that the persons who do the manual, mechanical work of the nation, constituting in the narrow sense the working classes, have been and are securing decade by decade an increasing share or proportion of a constantly increasing product to their own use and enjoyment.

The Twelfth Census of Manufactures: W. M. STEUART, Census Office, Washington, D. C.

At the census of 1900, when it was found that out of the 640,194 schedules secured, 343,233, or considerably more than half, were for the hand trades or for small shops with an annual product of less than $500, and also that the cost of collecting the schedules for the small shops was about the same per schedule as for the factories; for this and other reasons given in part I. of the report of manufactures, it was recommended that these industries be excluded from the twelfth census.

To recapitulate, the reports of the twelfth census show:

1. A clear demarcation between the neighborhood and mechanical trades and the factory industries.

2. There is a provision of law which excludes the neighborhood and mechanical trades from the census of 1905 and it is probable that they will be omitted from all subsequent censuses.

3. All new industries and industries that have developed from the household industries and passed into the factory system, such as the manufacture of textiles, should be considered as a part of the industrial development of the country.

4. The word 'manufactures' is defined in the census reports, but its definition can not be used as a criterion to separate the neighborhood and mechanical trades from the factory industries.

5. The gross value of the annual products of all classes of manufactures can be used to show relative increase.

6. The duplications in the value of products are eliminated in the census reports and either the net or gross value can be used.

7. The average wages should not be ascertained by dividing the total wages by the average number.

8. The number of wage-earners shown in the statistics of manufactures as employed in the different branches of industry can not agree with the number given in the statistics of population by occupations.

Currency Reform and Postal Savings System: Dr. M. Pietrzycki, Dayton, Wash.

It is proposed to create a special department of the government under the title, 'The Bank of the United States,' with powers and duties as follows:

A. To issue all national currency, this currency to be full legal tender without restrictions.

B. To redeem, cancel or destroy currency.

C. To organize and operate a postal savings system in connection.

A. The issuing of the currency is to be made only on bond security and under uniform and strict rules: (1) On national bonds, (2) on bonds of the states, (3) on bonds of the irrigation and reclamation districts, (4) on first-mortgage bonds of railroad companies.

B. This would require of the bank proposed that—(1) it redeem in coin any legal currency presented, (2) as new currency was issued present currency including greenbacks should be retired and destroyed, (3) as matured bonds were paid off corresponding proportions of the national currency should be destroyed.

C. Postal Savings System.—The 'Bank of the United States' should organize and conduct an efficient postal savings system, receiving, under suitable rules, deposits of money from the people, and paying interest on these deposits at the rate of $2\frac{1}{2}$ per cent. per annum, or less, as may be by the 'bank' from time to time determined, and on sums that have been on deposit sixty days or longer.

The government should, therefore, constantly keep a sufficient supply of gold to be able, and must be willing, to redeem the currency on demand.

Our Commercial Relations with Latin America: Harold Bolce, Washington, D. C.

It is customary to speak in jubilant terms of our commercial destiny in Central and South America. Up to the present, America's share in the foreign commerce of the southern islands and republics of this hemisphere is insignificant. The latest figures show that the foreign trade of the countries (exclusive of South America) washed by the Caribbean amounts to $462,000,000. When to that sum is added the value of the external commerce of the Atlantic republics of South America, the total is found to exceed one billion dollars. Of this splendid trade, to reach which no canal is necessary, the United States gets a pitiable ten per cent.

Of that ten per cent., nearly one half consists of food-stuffs, lumber and kerosene, practically non-competitive products. As a people, we have made almost no effort to get the trade of Latin America. But for the presence of American colonies in Mexico and the West Indies, our south-borne exports would be too paltry to enumerate in the totals of American prosperity. At the present rate of our shipments of merchandise to all lands between our border and Patagonia, it will require over one thousand years for the total value to equal the sum of the exchanges in 1905 in the clearing houses of the United States.

We look forward to sailing through the Panama Canal to a large commercial des-

tiny. But we are ignoring a billion dollar commerce on the Atlantic side of the isthmus. We have the wide sea as a trade path to the markets of the West Indies, Central America and the eastern portion of South America. To reach these fields, we have no more need of a canal at Panama than of the Northwest Passage. By the time we complete the Panama Canal, Japan may be the dominant commercial power of the Pacific. Even if the Chinese Empire were to remain friendly to America and the awakening of the whole orient be postponed until we are ready to travel through our waterway, the canal itself would not secure us the commerce of the far east any more than the Atlantic and Caribbean have secured us the trade of the eastern seaboard of Latin America.

JOHN FRANKLIN CROWELL,
Secretary.

NEW YORK CITY.

THE NEBRASKA ACADEMY OF SCIENCES.

THE sixteenth annual meeting of the Nebraska Academy of Sciences was held in Mechanic Arts Hall, University of Nebraska, February 2–3, 1906, under the presidency of Dr. R. H. Wolcott.

Resolutions were passed approving and urging the passage by Congress of the Adams bill providing for an increase in the appropriation granted to the Agricultural Experiment Stations; that creating the Mesa Verde National Park, and the Lacey bill providing for the preservation of American Antiquities.

The following officers were elected for the ensuing year:

President—Dr. S. R. Towne, Omaha.
Vice-president—Professor G. R. Chatburn, Lincoln.
Secretary—Dr. F. D. Heald, Lincoln.
Treasurer—Dr. H. H. Waite, Lincoln.
Directors—Dr. C. E. Bessey, Lincoln; Mr. G. A. Loveland, Lincoln; Dr. J. B. Hungate, Weeping Water; Dr. H. B. Lowrey, Lincoln.

The following papers were presented:

President's Address—Biological Conditions in Nebraska: ROBERT H. WOLCOTT.

Nebraska, owing to its geographical position, topography, climate and vegetal conditions, may be divided into five faunal areas: (1) a wooded Missouri River bluff area, (2) a prairie area, (3) the sand hills, (4) the plains, (5) a pine-forest foothill region in the northwest. These correspond closely to the floral regions. In early days the two wooded regions were sharply limited, but the planting of groves, orchards and shrubbery, together with the extension of the natural growth of timber and thickets, have led to the extinction of prairie and plains forms and the spreading into these regions of woodland species. Further and more pronounced changes are to be expected in the future. Of these areas the first two named belong to the Carolinian life zone as defined by Merriam, the next two to the Upper Sonoran, the last to the Transition. Merriam shows a close correspondence between life zones and crop zones. With the changing biological conditions in the state, agricultural possibilities are becoming increased. Crops may now be confidently expected which under former conditions could not have been secured. A biological survey of the state would bring out these possibilities, supplementing the work done by the experiment station, and furnishing a scientific basis for that work. Such an enterprise would be for the academy most appropriate, and would render its labors of great practical value, and would furnish a powerful argument upon which to base an appeal for support from the people of the state.

The Drifting of Sunspots: G. D. SWEZEY.

Observations of the sun were made every clear day from October 26 to November 24, 1905, and the position of the principal sunspots on the sun's disk was measured.